

# UTILITY PATENT APPLICATION TRANSMITTAL

Only for new nonprovisional applications under 37 CFR 1.53(b)

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First Named Inventor or Application Identifier

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## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

## ADDRESS TO:

Assistant Commissioner for Patent  
Box Patent Application  
Washington, DC 20231

☐ Fee Transmittal Form  
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification Total Pages 32

3. ☒ Drawing(s) (35 USC 113) Total Sheets 9

4. ☒ Oath or Declaration Total Pages 1

- a. ☐ Newly executed (original or copy)  
b. ☒ Unexecuted for information purposes  
c. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)  
[Note Box 5 below]

i. ☐ **DELETION OF INVENTOR(S)**  
Signed Statement attached deleting  
inventor(s) named in the prior application, see  
37 CFR 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (useable if Box 4c is checked)  
The entire disclosure of the prior application, from which a copy of  
the oath or declaration is supplied under Box 4c, is considered as  
being part of the disclosure of the accompanying application and is  
hereby incorporated by reference therein.

6. ☐ Microfiche Computer Program (Appendix)

7. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)

- a. ☐ Computer Readable Copy  
b. ☐ Paper Copy (identical to computer copy)  
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## ACCOMPANYING APPLICATION PARTS

8. ☐ Assignment Papers (cover sheet & document(s))  
9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)  
10. ☐ English Translation Document (if applicable)  
11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS  
Citations  
12. ☐ Preliminary Amendment  
13. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)  
14. ☐ Small Entity ☐ Statement filed in prior application  
Statement(s) Status still proper and desired  
15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)  
16. ☐ Other: \_\_\_\_\_

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. \_\_\_\_/\_\_\_\_

## 18. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label 05514  
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CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 CFR 1.16(c))	15-20	0	X \$ 18.00 =	0
	INDEPENDENT CLAIMS (37 CFR 1.16(b))	3-3 =	0	X \$ 78.00 =	0
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	Reduction by 50% for filing by small entity (Note 37 CFR 1.9, 1.27, 1.28).				
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19. Small entity status

- a. ☐ A Small entity statement is enclosed.
- b. ☐ A small entity statement was filed in the prior non-provisional application and such status is still proper and desired.
- c. ☐ Is no longer claimed.


20. ☒ A check in the amount of of \$690.00 to cover the filing fee is enclosed.

21. ☐ A check in the amount of \$ \_\_\_\_\_ to cover the recordal fee is enclosed.

22. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. 06-1205:

- a. ☒ Fees required under 37 CFR 1.16.
- b. ☒ Fees required under 37 CFR 1.17.
- c. ☐ Fees required under 37 CFR 1.18.

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED**

NAME	Leonard P. Diana, Esq. (Reg. No. 29,296)
SIGNATURE	
DATE	April 6, 2000

TITLE OF THE INVENTION

NETWORK TERMINAL APPARATUS AND METHOD OF PRESENTING  
DISPLAY THEREON

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FIELD OF THE INVENTION

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This invention relates to a network terminal  
apparatus and a method of presenting a display on this  
10 apparatus.

BACKGROUND OF THE INVENTION

When a function such as the inputting (scanning) or  
15 copying of an image from a server is implemented by a  
client in a conventional network system in which the  
image input server and a plurality of clients are  
connected via a network, it is necessary to present a  
display such as a settings dialog screen at the client  
20 apparatus in order that the client may check such  
settings information as the particular image input  
device to be used, the particular printer to be used,  
etc.

A problem with the prior-art arrangement described  
25 above is that when the client uses various devices on  
the network, the client cannot check the settings

information concerning the devices to be used without  
first performing an operation such as displaying a  
settings screen or executing the processing that is  
actually for using the devices. This is very  
5 inconvenient as far as the user is concerned.

#### SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is  
10 to provide a network terminal apparatus and a method of  
presenting a display thereon whereby it is possible to  
display, function by function and without performing a  
complicated operation, settings information concerning  
peripheral devices connected to a network.

15 Another object of the present invention is to  
provide greater user convenience by displaying settings  
information, which concerns the functions implemented by  
peripheral devices connected to a network, in close  
proximity to icons that represent the functions.

20 According to the present invention, the foregoing  
objects are attained by providing a network terminal  
apparatus comprising: search means for finding the  
connection status of each of various peripheral devices  
connected to a network; management means for managing  
25 settings information of a peripheral device for each  
function implemented by the peripheral device, based

upon the connection status found by the search means;  
icon display means for displaying, in icon form, each  
function managed by the management means; and settings  
information display means for displaying settings  
5 information concerning a peripheral device in regard to  
a function selected by a user from among the functions  
displayed by the icon display means.

Further, according to the present invention, the  
foregoing objects are attained by providing a method of  
10 presenting a display on a network terminal apparatus,  
the method comprising: a search step of finding the  
connection status of each of various peripheral devices  
connected to a network; a management step of managing  
settings information of a peripheral device for each  
15 function implemented by the peripheral device, based  
upon the connection status found at the search step; an  
icon display step of displaying, in icon form, each  
function managed at the management step; and a settings  
information display step of displaying settings  
20 information concerning a peripheral device in regard to  
a function selected by a user from among the functions  
displayed at the icon display step.

Other features and advantages of the present  
invention will be apparent from the following  
25 description taken in conjunction with the accompanying  
drawings, in which like reference characters designate

the same or similar parts throughout the figures thereof.

#### BRIEF DESCRIPTION OF THE DRAWINGS

5

Fig. 1 is a diagram illustrating the configuration of a network system according to an embodiment of the present invention;

10 Fig. 2 is a block diagram showing the construction of an image input server according to this embodiment;

Fig. 3 is a schematic view showing the organization of various function modules in the image input server;

Fig. 4 is a diagram showing the organization of various function modules in a client apparatus;

15 Fig. 5 is a diagram illustrating the data structure of connection information concerning peripheral devices on a network according to this embodiment;

20 Fig. 6 is a diagram showing the data structure of functions which implement processing utilizing an image input device and other peripheral devices;

Fig. 7 is a flowchart illustrating tool-tip display processing according to this embodiment;

25 Fig. 8 is a diagram illustrating menu icons and the status of connections of machines and various peripheral devices that belong to a network; and

Fig. 9 is a diagram showing a tool-tip display

according to this embodiment.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

5       A preferred embodiment of the present invention will now be described in detail with reference to the drawings.

          The configuration of the network system according to this embodiment will be described first.

10       Fig. 1 is a diagram showing a case where a network board 101 for connecting printers to a network has been connected to a printer 102 having an open architecture. The network board 101 is connected to a local area network (LAN) 100 via a LAN interface such as an  
15   Ethernet interface 10Base-2 having a coaxial connector or a 10Base-T having an RJ-45, etc.

          A plurality of personal computers 103, 104, etc., also are connected to the LAN 100 and are capable of communicating with the network board 101 under the  
20   control of an network operating system. Under these conditions, one of the personal computers, say, personal computer 103, can be designated so as to be used as a network management unit. Further, a peripheral device such as a printer 105 that has been connected to the  
25   personal computer 104, for example, may be connected to the personal computer 103.

Further, a file server 106 has been connected to the LAN 100 and manages access to files that have been stored in a large-capacity (e.g., 10-gigabyte) network disk 107. A print server 108 causes connected printers 5 109a, 109b or the remote printer 105, etc., to print. Other peripheral devices (not shown) may also be connected to the LAN 100.

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The network shown in Fig. 1 is capable of using network software such as Novell or UNIX software in 10 order that various interconnected networks may communicate with one another efficiently. It is possible to use any network software. For example, NetWare (a registered trademark of Novell), which is network software developed by Novell, can be used. For 15 a detailed description of this network software, refer to the online documentation bundled with the NetWare package. This can be purchased from Novell together with the NetWare package.

The file server 106 shown in Fig. 1 performs the 20 function of a file management unit for carrying out the reception, storage, queuing, caching and transmission of data files among the members connected to the LAN 100. For example, data files created by the personal computers 103, 104 are sent to the file server 106. The 25 file server 106 arranges and stores these data files in order and, in accordance with a command from the print



server 108, reads out the arranged data files and transmits them to the printer 109a.

Further, the personal computers 103 and 104 are ordinary personal computers which can generate data files and transmit the generated data files to the LAN 100 or which can receive data files from the LAN 100 and display and/or process these files. It should be noted that although personal computers are shown in Fig. 1, other types of computers suitable for the execution of network software may be included in the network. For example, in a case where UNIX software is being employed, UNIX workstations may be included in the network and these workstations can be used together with the illustrated personal computers under the appropriate conditions.

LANs such as the LAN 100 ordinarily provide service to several local user groups such as user groups on one or several successive floors in one building. A wide-area network (WAN) may be constructed in a case where certain users are separated from other users, as when some users are in another building or prefecture. A WAN basically is an aggregate formed by interconnecting several LANs by a high-speed digital line such as a high-speed Integrated Services Digital Network (ISDN) telephone line. Accordingly, as shown in Fig. 1, a WAN is formed by interconnecting the LAN 100, a LAN 110 and

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a LAN 120 via a modulator/demodulator (MODEM) /  
transponder 130 and a backbone 140. These connections  
are simple electrical connections by way of a several  
buses. It should be noted that each of these LANs  
5 includes dedicated personal computers and usually,  
though not necessarily, a file server and a print  
server.

Accordingly, as shown in Fig. 1, the LAN 110  
includes personal computers 111, 112, a file server 113,  
10 a network disk 114, a printer server 115, and printers  
116, 117. By contrast, the LAN 120 includes only  
personal computers 121 and 122. The devices that have  
been connected to each of the LANs 100, 110 and 120 are  
capable of accessing the functions of the devices of the  
15 other LANs via the WAN connection.

An example will now be described in which an image  
input device such as a scanner is connected to each of  
the personal computers 103, 104 shown in Fig. 1 and is  
connected to the network as an image input server.

20 Fig. 2 is a block diagram illustrating the  
construction of an image input server according to this  
embodiment. As shown in Fig. 2, a system bus 201  
connects various blocks, described later. A CPU  
(central processing unit) 202 controls the overall  
25 apparatus in accordance with a program, described later.  
A program memory (PMEM) 203 selects and reads in the

program, which is to be executed by the CPU 202, from a hard disk 210, described later. It should be noted that the program memory 203 functions also as a text memory for storing, as code information, data that has been entered from a keyboard 212, described later.

A communication controller 204 controls data communication performed via a communication port 205. The communication port 205 has been connected to the communication port of another device on the network by a communication line 206. According to this embodiment, it is assumed that exchange of data among peripheral devices such as printers or scanners shared on the network is carried out via the communication controller 204. Further, though a network such as a LAN has been mentioned as the communication line 206, it goes without saying that the present invention is applicable even if the communication port 205 and communication line 206 connected to the communication controller 204 are constituted by an ordinary public telephone line.

An external storage device controller 208 controls access to data-file disks, namely a floppy disk (FD) 209 and a hard disk (HD) 210, by way of example.

An input controller 211 has input units such as the keyboard 213 and a pointing device 213 such as a mouse connected thereto. The operator operates the system by operating the input controller 211 and manipulates image

information on a CRT 216 by operating the mouse 213.  
More specifically, by moving a cursor at will along the  
X and Y directions on the CRT 216, the operator selects  
command icons on a command menu to thereby designate  
5 processing, design editing objects and designate plot  
positions, etc.

A video image memory (VRAM) 214 stores bitmap data  
expanded for display purposes. A display output  
controller 215 outputs the bitmap data in VRAM 214 to  
10 the CRT 216. A printer controller 217 controls the  
output of data to a connected printer 218. An image  
input device controller 220 controls a connected image  
input device 221 such a scanner. An external device  
controller 219 controls the printer controller 217 and  
15 the image input device controller 220.

In a case where an image input device is connected  
and is used as an image input server, the image input  
device controller 220 and the image input device 221 are  
essential components. However, in case of an apparatus  
20 on the client side, such as the personal computer 103 or  
104 shown in Fig. 1, the identical shared components on  
the server side can be used via the communication  
controller 204 and communication port 205 described  
above.

25 Further, the image input device 221 and image input  
device controller 220 may be arranged as physically

separate components, as set forth above, or as a single component in which the image input device 221 contains the image input device controller 220.

The organization of modules for implementing the various functions related to the image input device of the image input server according to this embodiment will now be described.

Fig. 3 is a schematic view illustrating the organization of various function modules in an image input server. A network server module 301 converts data, which has been received from a server expansion module 302, described later, to a data format capable of being exchanged over a network and corresponding to a general-purpose network protocol, and converts network data, which has been sent from a device on the client side, to an internal data format which the server expansion module is capable of interpreting.

The server expansion module 302 analyzes data that has been delivered from the network server module 301, selects whichever of a plurality of image server modules under the control of this module has been designated and provides the applicable service, or delivers data from a certain service module to another service module. For example, the server expansion module 302 performs an operation such as calling an image input device control module from an OCR module, described later.

In a case where the server expansion module 302 requests any image input device for provision of a service, a common-interface conversion module 303 effects a conversion to a command instruction  
5 corresponding to the module that controls the image input device to which the request was issued. Conversely, the common-interface conversion module 303 effects a conversion to an ordinary interface that delivers device-specific control information, which has  
10 been obtained from the module that controls an image input device, to the server expansion module 302. More specifically, the former information is image read-in parameter setting information from a client and the latter is image information and its accessory  
15 information obtained as a result of designating reading.

An OCR module 304 is called from the server expansion module 302 when a client requests that image data read by an image input device be converted to text data. An image-data format conversion module 305  
20 converts the format of image data obtained from an image input device to an image data format designated by a client. An image input device control module 306 performs control conforming to the individual image input device 307. The image input device control module  
25 306 inputs/outputs control instructions/information conforming to (specialized for) the particular device.

Described next will be the organization of modules which implement various functions for inputting image information from a locally connected image input device, and modules which implement various functions for  
5 inputting image information from an image input server connected via a network. These modules are located in an apparatus on the client side, such as the personal computers 103, 104 shown in Fig. 1.

Fig. 4 is a diagram showing the organization of  
10 various function modules in a client apparatus. Modules 401 to 404 are necessary in order to access locally connected image input devices from a general application in the client apparatus. Specifically, numeral 401 denotes a general application that requires an input of  
15 image data, and 402 an image input device manager for providing the application 401 with a general-purpose image-input interface. The image input device manager 402 performs an exchange of information with whichever  
20 one of image input device control modules under its management has been designated in dependence upon a designation made by an image input interface.

An image input device control module 403 having a general-purpose input/output is for controlling an image input device individually connected by a general-purpose  
25 interface. The image input device is decided between the module 403 and the image input device manager 402.

Further, the module 403 provides a general-purpose interface, unlike the image input device control module 306 shown in Fig. 3. That is, functionally speaking, the module 403 is a combination of the image input  
5 device control module 306, the common-interface conversion module 303 and a general-purpose image input interface conversion module, described later.

More specifically, the image input device manager 402 is a TWAIN (Technology Without Any Interested Name)  
10 manager, by way of example. The image input device control module 403 is equivalent to a TWAIN driver, which corresponds to an individual image input device. Individual image input devices 404 are locally connected to this apparatus.

15 A client function control module 405 is a module which performs overall management of modules for implementing client extensions, described later. A module 406 for generating image input device connection information acquires attribute information, which  
20 concerns peripheral devices that have been connected on the server side, obtained utilizing a network client module 408, described later, and information necessary for a network connection. The module 406 generates connection information 410 of individual image input  
25 devices. At the same time, the module 406 automatically generates control modules 409 of virtual image input



devices. By generating these modules, the image input  
device manager 402 is capable of handling the network  
image input devices as if they were virtually connected.  
The connection information 410 of individual image input  
5 devices will be described later.

A general-purpose image input interface conversion  
module 407 converts control information regarding image  
input devices on the server side, which information has  
been obtained utilizing the network client module 408,  
10 to a general-purpose interface conforming to the image  
input device manager 402. The module 407 does not  
directly provide the image input device manager 402 with  
the functions possessed by these interfaces but provides  
them via the individual control modules 409 of the  
15 virtual image input devices, as will be described later.

The network client module 408 effects a conversion  
to a data format capable of being exchanged over a  
network and corresponding to a general-purpose network  
protocol in such a manner that each module mentioned  
20 above and modules on the server side can communicate.

The control modules 409 of the virtual image input  
devices are generated in a 1:1 ratio with respect to the  
set image input devices on the network. The control  
modules 409 basically perform only processing which  
25 intervenes in intermediate fashion, i.e., they send back  
corresponding image input device connection information

410 or deliver the same information to the general-purpose image input interface conversion module 407 and deliver the results to the image input device manager 402. As described above, the general-purpose image input interface conversion module 407 carries out the major portion of the actual processing. As a result, the modules 409 can be reduced in size and there is little overhead even if modules for a plurality of image input devices on the network are created.

It should be noted that this embodiment is described in regard to modules for generating connection information of image input devices, which have been connected locally or via a network, in a client apparatus. However, connection information of output devices on the network can also be generated by similarly constructed control modules for virtual output devices.

Described next will be the data structure of the connection information 410 of image input devices and the connection information of output devices (connection information of peripheral devices which exist on the network), which information is generated in the client apparatus.

Fig. 5 is a diagram illustrating the data structure of connection information concerning peripheral devices on a network according to this embodiment. Numerals 501

to 505 denote information relating to one image input device capable of being utilized. These items of information have been read in from a server in relation to a device shared on the network. This is connection  
5 information concerning the user's own machine in regard to a device that has been connected to the user's own machine.

The information 501 is for identifying a server that is the destination of a connection on the network,  
10 i.e., a machine name or network address on the network. The information 502 is the network name of the utilizable image input device for identifying this device on the network. The information 503 is necessary for making a connection to other networks.

15 The information 504 and 505 is device identifying information for supplying virtual device information to the image input device manager 402 described above. Specifically, numeral 504 denotes device name information and 505 other identifying information.

20 In a case where a plurality of utilizable image input devices exist on the network, a plurality of items of information reside in the data structure in a manner similar to 501 to 505. This example illustrates a case where N-number of utilizable image input devices exist  
25 on the network. Numerals 501 to 505 and numerals 501n to 505n denote the respective items of information.

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Numerals 506 to 510 denote items of information concerning one output device (e.g., a printer) that is capable of being utilized.

The information 506 is for identifying a server  
5 that is the destination of a connection on the network,  
i.e., a machine name or network address on the network.  
The information 507 is the network name of the  
utilizable output device (printer) for identifying this  
device on the network. The information 508 is necessary  
10 for making a connection to other networks. Numerals 509  
and 510 denote device name information and other  
identifying information, respectively.

In a case where a plurality of utilizable output  
devices (printers, for example) exist on the network, a  
15 plurality of items of information reside in the data  
structure in a manner similar to 506 to 510. This  
example illustrates a case where M-number of utilizable  
output devices exist on the network. Numerals 506 to  
510 and numerals 506m to 510m denote the respective  
20 items of information.

Numeral 511 denotes information indicating  
utilizable peripheral devices other than image input  
devices and output devices. In a case where a plurality  
of such utilizable devices exist on the network in a  
25 manner similar to the image input devices or output

devices, a plurality of these items of information will reside in the data structure.

Described next will be management information for managing various functions such as image reading and  
5 copying executed utilizing the above-mentioned image input devices, output devices and other devices.

Fig. 6 is a diagram showing the data structure of functions which implement processing utilizing an image input device and other peripheral devices. Here  
10 numerals 601 to 604 denote management information of a function 1. This is an example of the data structure of management information in a function which utilizes an image input device and stores information that has been read. Specifically, a function identifier 601 decides  
15 the type of peripheral device (e.g., a scanner) used in processing. Numeral 602 denotes the type of peripheral device used. This indicates information concerning the type of peripheral device (a scanner in this case) decided by the function identifier 601. Numeral 603  
20 denotes information concerning the server that is the destination of the connection. This is information for identifying the network server of the peripheral device used (the scanner in this case), the server being the destination of the connection. In other words, the  
25 machine name or network address thereof on the network is set as this information. Numeral 604 denotes the

network name of the image input device configured for sharing on the network. This network name is for identifying the image input device on the network.

NUMERALS 605 TO 611 DENOTE MANAGEMENT INFORMATION

5 of a function 2. This is an example of the data structure of management information in a function which utilizes an image input device and an output device and outputs data that has been read. A function identifier 605 decides the types of peripheral devices (e.g., a

10 scanner and a printer) used in processing. This is similar to the identifier 601. Numerals 606 and 607 denote the types of peripheral devices used. This is information concerning the types of peripheral devices (a scanner and printer in this case) decided by the

15 function identifier 605. Numeral 608 denotes information concerning the server that is the destination of the connection of peripheral device 1. This is information for identifying the network server of the peripheral device 1 used (the scanner in this

20 case), the server being the destination of the connection. In other words, the machine name or network address thereof on the network is set as this information. Numeral 609 denotes the network name of the image input device configured for sharing on the

25 network. This network name is for identifying the image input device on the network. Numeral 610 denotes the

type of server that is the destination of the connection  
of peripheral device 2. This is information for  
identifying the network server of the peripheral device  
2 used (the printer in this case), the server being the  
5 destination of the connection. In other words, the  
machine name or network address thereof on the network  
is set as this information. Numeral 611 denotes the  
network name of this output device configured for  
sharing on the network. This network name is for  
10 identifying the output device on the network.

Numerals 612, 613 denote management information of  
a function n. These items of information similarly  
represent data structure in a case where there are a  
plurality of types of peripheral devices utilized.  
15 Numeral 612 denotes the identifier of the nth function,  
and numeral 613 sets one or a plurality of types of  
information groups of a peripheral device used. Thus,  
settings information such as the type of peripheral  
device which executes each function and information  
20 concerning the connection destination server is set on a  
per-function basis. As a result, settings information  
can be managed universally even if the type of function  
for executing a function and the type of peripheral  
device are changed or supplemented.

25 Described next will be display processing at an  
apparatus on the client side for displaying, in the form

of tool tips (described later), settings information of functions implemented by image input devices, output devices and other peripheral devices connected to the network in the arrangement set forth above.

5        Fig. 7 is a flowchart illustrating tool-tip display processing according to this embodiment. This processing is implemented by having the CPU 202 execute a program that has been stored in the program memory 203.

10        First, at step S701, settings information concerning an image input device or output device, etc., desired to be utilized, which information has been established for each function, is called. More specifically, information concerning a peripheral device  
15        desired to be utilized is called from the management information of each function illustrated in Fig. 6.

Next, information relating to the machines and various peripheral devices belonging to the network is searched for at step S702. Here the peripheral-device connection  
20        information shown in Fig. 5 is searched to acquire each item of information. This is followed by step S703, at which the information concerning the various utilizable peripheral devices is recorded from the items of  
information acquired by the search.

25        On the basis of the various items of information acquired at step S702, the configuration information



concerning the machines and various peripheral devices in the network is displayed at step S704.

Fig. 8 is a diagram illustrating menu icons and the status of connections of machines and various peripheral devices that belong to a network. A menu icon 801 in Fig. 8 is composed of tool icons for implementing various functions, such as copy, facsimile, scan and OCR functions. Numeral 802 denotes a client apparatus and numerals 803, 804 and 805 represent peripheral devices connected to certain machines.

A "+" to the right of a machine is a symbol indicating a state in which peripheral devices have been connected to the machine, and a "-" to the right of a machine is a symbol signifying that the connected peripheral devices are being displayed.

With reference again to Fig. 7, the user performs an operation at step S705 to determine whether the settings information of each function has been updated from the state of step S701. If the settings information has not been updated, control proceeds to step S707. If the settings information has been updated, then control proceeds to step S706, at which information update processing is applied to the settings information called at step S701.

If the user places a mouse or other pointing-device cursor on a function-implementing tool icon for a fixed

period of time at step S707, control proceeds to step S708, at which a tool tip that includes settings information of this function is displayed in the proximity of the tool icon designated.

5           Fig. 9 is a diagram showing a tool-tip display according to this embodiment. Here it is assumed that the content displayed by this tool tip displays some or all of the management information of each function shown in Fig. 6. In the example depicted in Fig. 9, a tool  
10 tip 903 is displayed in the proximity of tool icon 901 (e.g., function 2 in Fig. 6) if a pointing-device cursor 902 is placed on the tool icon 901 for a fixed period of time.

          An example of the content displayed in tool tip 903  
15 is "NETWORK NAME OF IMAGE INPUT DEVICE" (609), "INFORMATION CONCERNING CONNECTION-DESTINATION SERVER OF PERIPHERAL DEVICE 1" (608), "NETWORK NAME OF OUTPUT DEVICE" (611), and "INFORMATION CONCERNING CONNECTION-DESTINATION SERVER OF PERIPHERAL DEVICE 2" (610).

20           Thus, in accordance with this embodiment, function-by-function settings information of various peripheral devices, which information has been set in a client apparatus in a network system composed of an image input server and a client on a network, is displayed in the  
25 form of tool tips. As a result, settings information of various peripheral devices set on a per-function basis

can readily be displayed without displaying various settings screens.

The present invention can be applied to a system constituted by a plurality of devices (e.g., a host  
5 computer, interface, reader, printer, etc.) or to an apparatus comprising a single device (e.g., a copier or facsimile machine, etc.).

Furthermore, it goes without saying that the object of the invention is attained also by supplying a storage  
10 medium storing the program codes of the software for performing the functions of the foregoing embodiment to a system or an apparatus, reading the program codes with a computer (e.g., a CPU or MPU) of the system or apparatus from the storage medium, and then executing  
15 the program codes.

In this case, the program codes read from the storage medium implement the novel functions of the embodiment, and the storage medium storing the program codes constitutes the invention.

20 Further, the storage medium for supplying the program code can employ a floppy disk, hard disk, optical disk, magneto-optical disk, CD-ROM, CD-R, magnetic tape, non-volatile type memory card or ROM.

Furthermore, besides the case where the aforesaid  
25 functions according to the embodiment are implemented by executing the program codes read by a computer, it goes

without saying that the present invention covers a case  
where an operating system or the like running on the  
computer performs a part of or the entire process in  
accordance with the designation of program codes and  
5 implements the functions according to the embodiment.

It goes without saying that the present invention  
further covers a case where, after the program codes  
read from the storage medium are written in a function  
expansion board inserted into the computer or in a  
10 memory provided in a function expansion unit connected  
to the computer, a CPU or the like contained in the  
function expansion board or function expansion unit  
performs a part of or the entire process in accordance  
with the designation of program codes and implements the  
15 function of the above embodiment.

Thus, in accordance with the present invention, as  
described above, it is possible to provide greater user  
convenience by displaying, function by function and  
without performing a complicated operation, the settings  
20 information of peripheral devices connected on a  
network.

As many apparently widely different embodiments of  
the present invention can be made without departing from  
the spirit and scope thereof, it is to be understood that  
25 the invention is not limited to the specific embodiments  
thereof except as defined in the appended claims.

WHAT IS CLAIMED IS:

1. A network terminal apparatus comprising:

search means for finding the connection status of  
each of various peripheral devices connected to a

5 network;

management means for managing settings information  
of a peripheral device for each function implemented by  
the peripheral device, based upon the connection status  
found by said search means;

10 icon display means for displaying, in icon form,  
each function managed by said management means; and

settings information display means for displaying  
settings information concerning a peripheral device in  
regard to a function selected by a user from among the  
15 functions displayed by said icon display means.

2. The apparatus according to claim 1, wherein said  
management means manages, function by function, a  
peripheral device which the user desires to utilize.

3. The apparatus according to claim 1, wherein said  
20 icon display means displays each function in the form of  
a menu.

4. The apparatus according to claim 1, wherein said  
settings information display means displays at least  
information relating to the type of peripheral device, a  
25 network name of the peripheral device and a connection-  
destination server thereof as the settings information

of the peripheral device.

5 The apparatus according to claim 1, further comprising designating means for allowing the user to designate, in order to select, a desired function from among the functions displayed by said icon display means;

wherein when an icon display of a desired function is designated for a predetermined period of time by said designating means, said settings information display  
10 means displays settings information of the peripheral device in regard to this desired function in the proximity of the icon display.

6. A method of presenting a display on a network terminal apparatus, the method comprising:  
15 a search step of finding the connection status of each of various peripheral devices connected to a network;

a management step of managing settings information of a peripheral device for each function implemented by  
20 the peripheral device, based upon the connection status found at said search step;

an icon display step of displaying, in icon form, each function managed at said management step; and

a settings information display step of displaying  
25 settings information concerning a peripheral device in regard to a function selected by a user from among the

functions displayed at said icon display step.

7. The method according to claim 6, wherein said management step manages, function by function, a peripheral device which the user desires to utilize.

5 8. The method according to claim 6, wherein said icon display step displays each function in the form of a menu.

9. The method according to claim 6, wherein said settings information display step displays at least  
10 information relating to the type of peripheral device, a network name of the peripheral device and a connection-destination server thereof as the settings information of the peripheral device.

10. The method according to claim 6, further comprising  
15 a designating step of allowing the user to designate, in order to select, a desired function from among the functions displayed at said icon display step;

wherein when an icon display of a desired function is designated for a predetermined period of time at said  
20 designating step, said settings information display step displays settings information of the peripheral device in regard to this desired function in the proximity of the icon display.

11. A computer-readable storage medium storing program  
25 codes of a method of presenting a display on a network terminal apparatus, said storage medium comprising the

codes of:

a search step of finding the connection status of each of various peripheral devices connected to a network;

- 5 a management step of managing settings information of a peripheral device for each function implemented by the peripheral device, based upon the connection status found at said search step;

an icon display step of displaying, in icon form,  
10 each function managed at said management step; and

a settings information display step of displaying settings information concerning a peripheral device in regard to a function selected by a user from among the functions displayed at said icon display step.

- 15 12. The storage medium according to claim 11, wherein the code of said management step manages, function by function, a peripheral device which the user desires to utilize.

13. The storage medium according to claim 11, wherein  
20 the code of said icon display step displays each function in the form of a menu.

14. The storage medium according to claim 11, wherein the code of said settings information display step displays at least information relating to the type of  
25 peripheral device, a network name of the peripheral device and a connection-destination server thereof as



the settings information of the peripheral device.

15. The storage medium according to claim 11, further comprising code of a designating step of allowing the user to designate, in order to select, a desired

- 5 function from among the functions displayed in the form of icons;

wherein when an icon display of a desired function is designated for a predetermined period of time by the code of said designating step, the code of said settings  
10 information display step displays settings information of the peripheral device in regard to this desired function in the proximity of the icon display.

ABSTRACT OF THE DISCLOSURE

- The connection status of each of various peripheral devices connected to a network is found and, on the basis of the connection status found, a plurality of
- 5 functions implemented by one or a plurality of peripheral devices are managed, function by function, together with settings information of the peripheral device or devices which implement the functions. Each managed function is displayed in the form of an icon.
- 10 Settings information (903) of a peripheral device in regard to a function (901) selected by the user from among functions displayed as icons is displayed in the proximity of the icon of the function.

FIG. 1

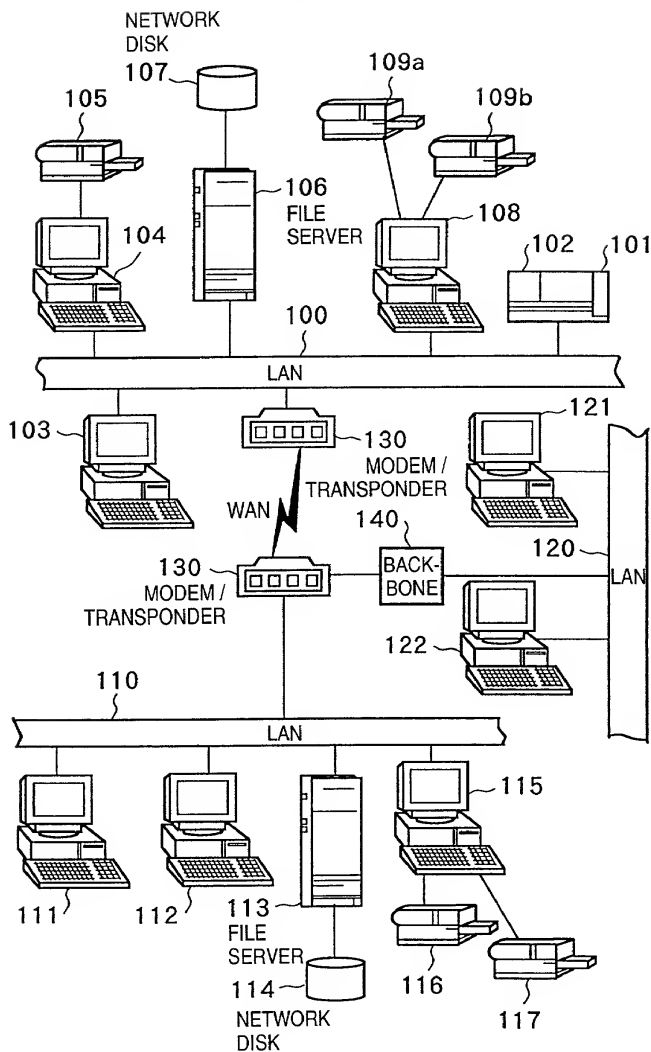
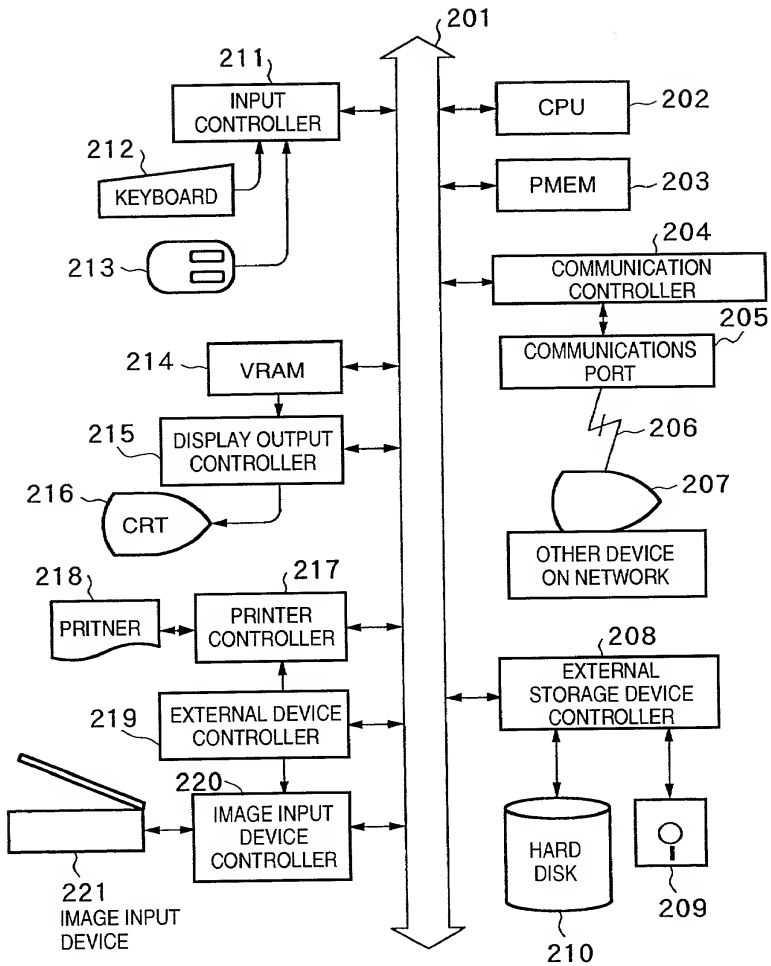
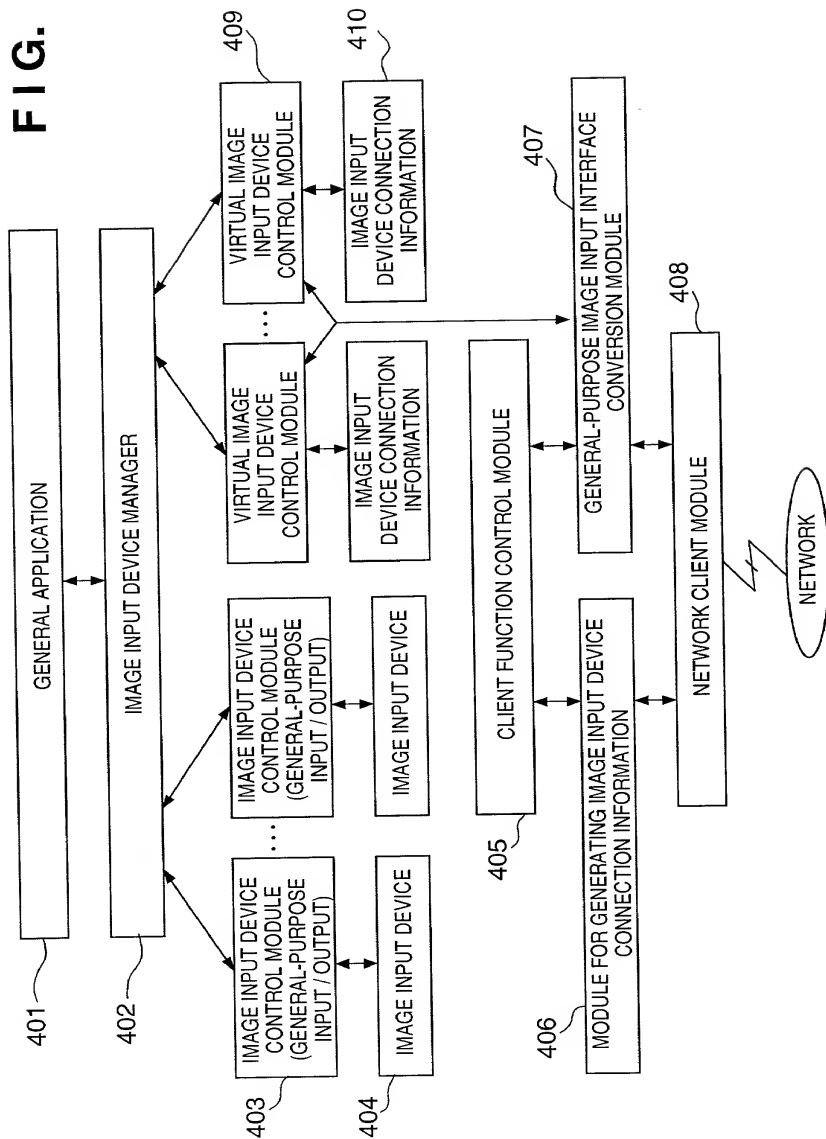


FIG. 2





**FIG. 4**



CONNECTION INFORMATION OF IMAGE INPUT DEVICE	FIRST DEVICE INFORMATION	INFORMATION CONCERNING CONNECTION-DESTINATION SERVER	~501
		NETWORK NAME OF IMAGE INPUT DEVICE	~502
		OTHER NETWORK CONNECTION INFORMATION	~503
		DEVICE NAME	~504
		OTHER IDENTIFICATION INFORMATION	~505
		⋮	
	nth DEVICE INFORMATION	INFORMATION CONCERNING CONNECTION-DESTINATION SERVER	~501n
		NETWORK NAME OF IMAGE INPUT DEVICE	~502n
		OTHER NETWORK CONNECTION INFORMATION	~503n
		DEVICE NAME	~504n
		OTHER IDENTIFICATION INFORMATION	~505n
CONNECTION INFORMATION OF OUTPUT DEVICE	FIRST DEVICE INFORMATION	INFORMATION CONCERNING CONNECTION-DESTINATION SERVER	~506
		NETWORK NAME OF OUTPUT DEVICE	~507
		OTHER NETWORK CONNECTION INFORMATION	~508
		DEVICE NAME	~509
		OTHER IDENTIFICATION INFORMATION	~510
		⋮	
	mth DEVICE INFORMATION	INFORMATION CONCERNING CONNECTION-DESTINATION SERVER	~506m
		NETWORK NAME OF OUTPUT DEVICE	~507m
		OTHER NETWORK CONNECTION INFORMATION	~508m
		DEVICE NAME	~509m
		OTHER IDENTIFICATION INFORMATION	~510m
CONNECTION INFORMATION OF OTHER DEVICES		VARIOUS INFORMATION CONCERNING OTHER PERIPHERAL DEVICES	~511

**FIG. 6**

MANAGEMENT INFORMATION OF FUNCTION 1	FUNCTION IDENTIFIER	601
	TYPE OF PERIPHERAL DEVICE USED	602
	INFORMATION CONCERNING CONNECTION-DESTINATION SERVER	603
	NETWORK NAME OF IMAGE INPUT DEVICE	604
MANAGEMENT INFORMATION OF FUNCTION 2	FUNCTION IDENTIFIER	605
	PERIPHERAL DEVICE USED : TYPE 1	606
	PERIPHERAL DEVICE USED : TYPE 2	607
	INFORMATION CONCERNING CONNECTION- DESTINATION SERVER OF PERIPHERAL DEVICE 1	608
	NETWORK NAME OF IMAGE INPUT DEVICE	609
	INFORMATION CONCERNING CONNECTION- DESTINATION SERVER OF PERIPHERAL DEVICE 2	610
	NETWORK NAME OF OUTPUT DEVICE	611
	...	
MANAGEMENT INFORMATION OF FUNCTION n	FUNCTION IDENTIFIER	612
	VARIOUS INFORMATION CONCERNING OTHER PERIPHERAL DEVICES	613
	...	



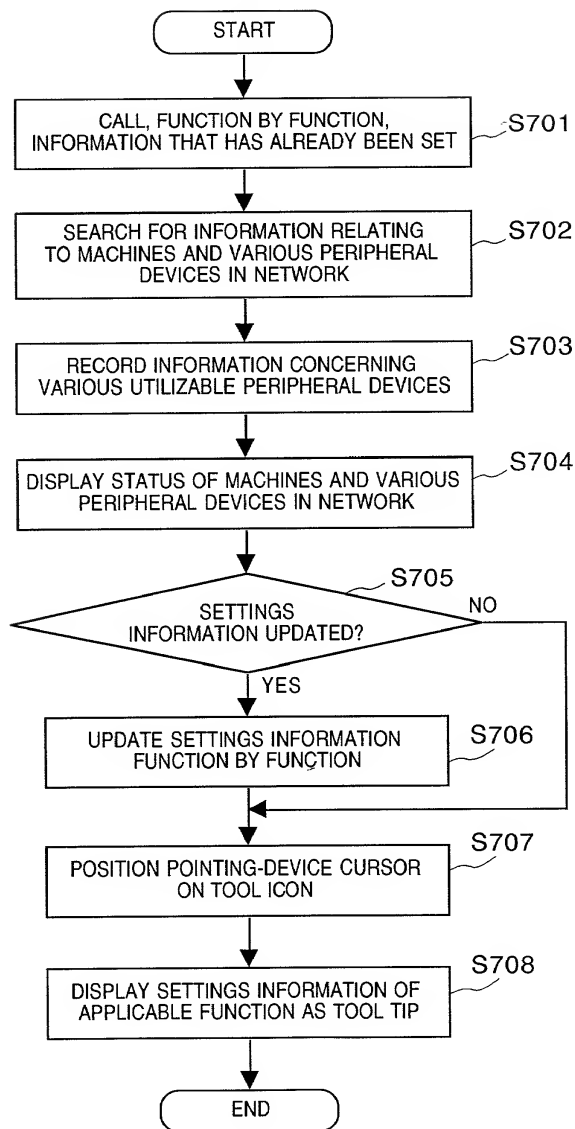
**FIG. 7**

FIG. 8

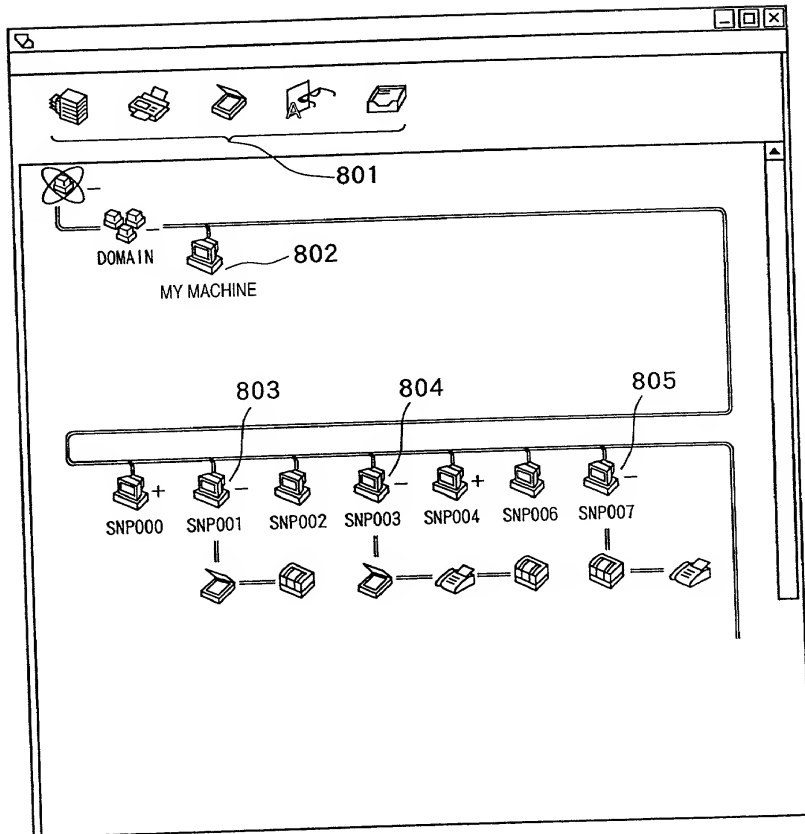
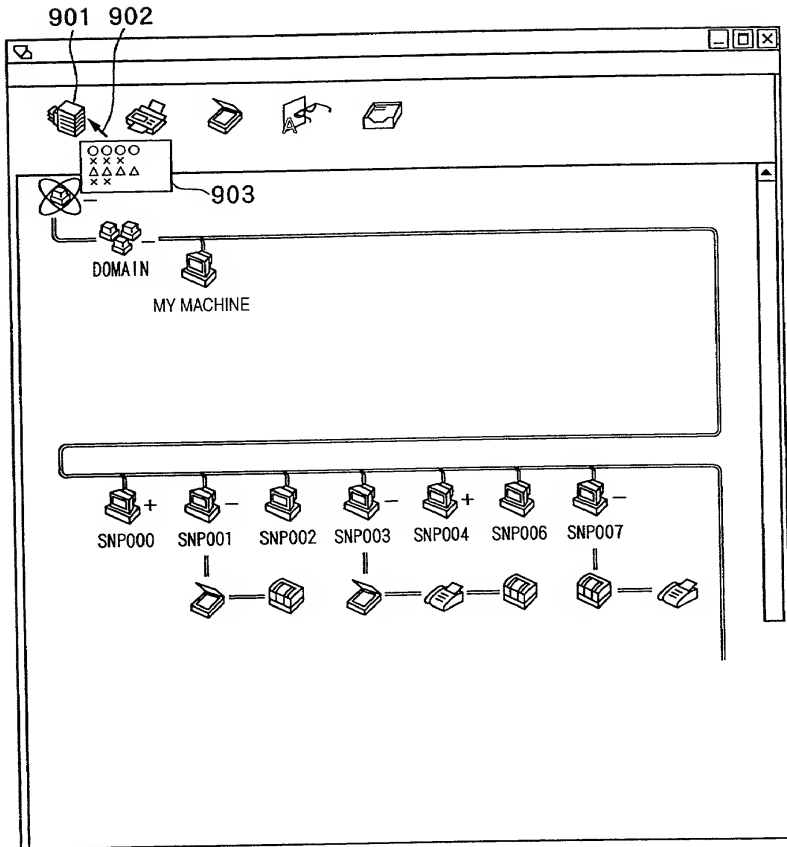


FIG. 9



COMBINED DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION  
(Page 1)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled NETWORK  
TERMINAL APPARATUS AND METHOD OF PRESENTING DISPLAY THEREON

the specification of which ☒ is attached hereto ☐ was filed on \_\_\_\_\_ as United States  
Application No. or PCT International Application No. \_\_\_\_\_ (if applicable).  
and was amended on \_\_\_\_\_

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b), of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT international application which designates at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed:

Country	Application No.	Filed (Day/Mo./Yr.)	(Yes/No) Priority Claimed
JAPAN	11-103221	09 April 1999	YES

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT international application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

Application No.	Filed (Day/Mo./Yr.)	Status (Patented, Pending, Abandoned)
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I hereby appoint the practitioners associated with the firm and Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and direct that all correspondence be addressed to the address associated with that Customer Number:

**FITZPATRICK, CELLA, HARPER & SCINTO**  
Customer Number: 05514

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole or First Inventor KATSUHIISA WATANABE

Inventor's signature \_\_\_\_\_

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